



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/847,658	05/02/2001	Wolfgang Singer	82704	7054

7590 10/08/2003

Gerald T. Shekleton, Esq.
Welsh & Katz, Ltd.
120 S. Riverside Plaza, 22nd Floor
Chicago, IL 60606

EXAMINER

CHOI, WILLIAM C

ART UNIT	PAPER NUMBER
----------	--------------

2873

DATE MAILED: 10/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/847,658	Applicant(s) SINGER ET AL.	
	Examiner William C. Choi	Art Unit 2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 7, 19-25, 27-32 and 34-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20, 23 and 36 is/are allowed.
- 6) ☒ Claim(s) 1-3, 7, 19, 21, 22, 24, 28, 29, 31, 32 and 37-42 is/are rejected.
- 7) ☒ Claim(s) 20, 23, 25, 27, 30 and 34-36 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 May 2001 and 07 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>14</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 8/4/2003 has been entered.

Information Disclosure Statement

Receipt of the Information Disclosure Statement (IDS) with the copies of the references cited therein was received on 8/4/2003. An initialized copy of the IDS is enclosed with this office action.

Claim Objections

Claims 21, 37, 38 and 39 are objected to because of the following informalities: in line 5 of claim 21, "varies" should be changed to "varied"; in line 4 of claim 37, "paralela" should be separated into cancelled portion "parallel" and currently pending, "a" for clarity; and in line 4 of claims 38 and 39, "paralela" should be changed to "parallel". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 22 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, in line 2, applicant claims wherein the “refractive index can be set via the **gas composition**”, when it’s dependent claim 19, discloses wherein the refractive index is varied by “**pressure changes**” in line 5, thereby rendering the claim vague and indefinite. For purposes of examination, it was assumed applicant meant for the limitation to disclose the refractive index being, “set via the **pressure**”.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 7, 19, 22, 37 and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by Kosugi et al (U.S. 4,676,631).

In regards to claim 1, Kosugi et al discloses a projection lens (column 4, lines 25-28, Figure 3, “22), having an object plane (column 4, lines 25-26, Figure 4, “20”), having

Art Unit: 2873

an image plane (column 4, lines 28-30, Figure 3, "21"), having a lens arrangement (column 4, lines 45-50, Figures 4 and 5, "22") and having at least one gas chamber filled with gas (column 4, lines 59-61, Figure 4, "6"), wherein the gas chamber is constructed as an at least approximately plane-parallel manipulation chamber (column 4, lines 59-61, Figure 4, "3, 4") located between the lens arrangement (Figures 4 and 5, "22") and the image plane (Figure 4, "21"), and wherein the manipulation chamber is connected with pressure change means (column 4, lines 61-68, Figure 4, "29").

Regarding claim 7, Kosugi et al discloses wherein an end plate of the lens arrangement is bipartite, and wherein the two end plate parts are arranged at a spacing from one another and form the manipulation chamber between them (column 8, lines 1-19, Figure 5, "3, 4").

In regards to claim 19, Kosugi et al discloses a system for projection lens (column 4, lines 25-28, Figure 3, "22"), having an object plane (column 4, lines 25-26, Figure 4, "20"), having an image plane (column 4, lines 28-30, Figure 4, "21"), having a lens arrangement (Figures 4 and 5, "22") and having at least one gas chamber filled with gas (column 4, lines 59-61, Figure 4, "6"), wherein the gas chamber is a manipulation chamber formed between adjacent plane-parallel optical elements (column 8, lines 1-19, Figure 5, "3, 4"), and wherein the refractive index can be varied in the manipulation chamber by pressure changes (column 4, lines 61-68 and column 2, lines 11-15 and 49-52, Figure 4, "29").

Regarding claim 22, the offset of the refractive index would inherently be set via the pressure in such a way that the refractive index can be manipulated in both

directions, this being reasonably assumed from Kosugi et al disclosing the invention correcting for changes in ambient pressure, which can increase or decrease (column 2, lines 32-39).

In regards to claim 37, Kosugi et al discloses a projection lens for microlithography (column 1, lines 15-30 and column 4, lines 25-28, Figure 3, "22"), having an object plane (column 4, lines 25-26, Figure 4, "20"), having an image plane (column 4, lines 28-30, Figure 4, "21"), having a lens arrangement (Figures 4 and 5, "22") and having at least one gas chamber filled with gas (column 4, lines 59-61, Figure 4, "6"), wherein the gas chamber is a manipulation chamber formed between adjacent plane-parallel optical elements (column 8, lines 1-19, Figure 5, "3, 4"), and wherein the manipulation chamber is connected with pressure change means (column 4, lines 61-68, Figure 4, "29").

In regards to claim 40, Kosugi et al discloses a projection lens (column 4, lines 25-28, Figure 3, "22"), having an object plane (column 4, lines 25-26, Figure 4, "20"), having an image plane (column 4, lines 28-30, Figure 4, "21"), having a lens arrangement (Figures 4 and 5, "22") and having at least one gas chamber filled with gas (column 4, lines 59-61, Figure 4, "6"), wherein the gas chamber is constructed as an at least approximately plane-parallel manipulation chamber (column 8, lines 1-19, Figure 5, "3, 4") located in the lens arrangement (Figure 5, "6") and between an end plate (Figure 5, "3") and the lens situated adjacent to the end plate (Figure 5, "4"), and wherein the manipulation chamber is connected with pressure change means (column 4, lines 61-68, Figure 4, "29").

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 3, 21, 24, 29, 31, 32, 38, 39, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosugi et al and further in view of Taniguchi (U.S. 6,333,776 B1).

In regards to claims 2 and 3, Kosugi et al discloses a projection lens (column 4, lines 25-28, Figure 3, "22"), having an object plane (column 4, lines 25-26, Figure 4, "20"), having an image plane (column 4, lines 28-30, Figure 3, "21"), having a lens arrangement (column 4, lines 45-50, Figures 4 and 5, "22") and having at least one gas chamber filled with gas (column 4, lines 59-61, Figure 4, "6"), wherein the gas chamber is constructed as an at least approximately plane-parallel manipulation chamber (column 4, lines 59-61, Figure 4, "3, 4") located between the lens arrangement (Figures 4 and 5, "22") and the image plane (Figure 4, "21"), and wherein the manipulation chamber is connected with pressure change means (column 4, lines 61-68, Figure 4, "29"), but does not specifically disclose said manipulation chamber being connected to a gas composition change means. Within the same field of endeavor, Taniguchi teaches that it is well known for manipulation chambers in projection exposure systems to undergo changes in pressure or gas composition to correct for image distortion (column 9, lines 11-16).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the manipulation chamber of Kosugi et al to be connected to a gas composition change means since Taniguchi teaches that it is well known for manipulation chambers in projection exposure systems to undergo changes in pressure or gas composition to correct for image distortion, which also would inherently also comprise a pressure change means since different gases contribute different partial pressures to a system.

In regards to claim 21, Kosugi et al discloses a system for projection lens (column 4, lines 25-28, Figure 3, "22"), in particular for microlithography (column 1, lines 15-30), having an object plane (column 4, lines 25-26, Figure 4, "20"), having an image plane (column 4, lines 28-30, Figure 3, "21"), having a lens arrangement (column 4, lines 45-50, Figures 4 and 5, "22") and having at least one gas chamber filled with gas (column 4, lines 59-61, Figure 4, "6"), wherein the gas chamber is constructed between adjacent approximately plane-parallel optical elements to form a manipulation chamber (column 8, lines 1-19, Figure 5, "3, 4"), and wherein the refractive index can be varied in the manipulation chamber by pressure changes (column 4, lines 61-68 and column 2, lines 11-15 and 49-52, Figure 4, "29"), but does not specifically disclose changes in gas composition. Within the same field of endeavor, Taniguchi teaches that it is well known for manipulation chambers in projection exposure systems to undergo changes in pressure or gas composition to correct for image distortion (column 9, lines 11-16).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the manipulation chamber of Kosugi et al to be

Art Unit: 2873

connected to a gas composition change means since Taniguchi teaches that it is well known for manipulation chambers in projection exposure systems to undergo changes in pressure or gas composition to correct for image distortion, which would inherently vary the refractive index of the chamber since each gas component contributes a different refractive index component to the system.

Regarding claim 24, the offset of the refractive index could inherently be set via the gas composition in such a way that the refractive index can be manipulated in both directions since Taniguchi teaches the correction means correcting for changes in atmospheric pressure which can increase or decrease (column 9, lines 17-19).

In regards to claim 29, Kosugi et al discloses a method for producing microstructured components, in the case of which a substrate provided with a light-sensitive layer is exposed to UV light by means of a mask and a projection exposure machine with a lens arrangement (column 1, lines 15-30), wherein an at least approximately plane-parallel manipulation chamber (column 8, lines 1-19, Figure 5, "3, 4") which is connected to a gas source (column 4, lines 61-68) is created in the projection exposure machine, and manipulating the refractive index by pressure changes (column 4, lines 59-61), but does not specifically disclose changes in gas composition. Within the same field of endeavor, Taniguchi teaches that it is well known for manipulation chambers in projection exposure systems to undergo changes in pressure or gas composition to correct for image distortion (column 9, lines 11-16).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the manipulation chamber of Kosugi et al to be

connected to a gas composition change means since Taniguchi teaches that it is well known for manipulation chambers in projection exposure systems to undergo changes in pressure or gas composition to correct for image distortion.

Regarding claims 31 and 32, Kosugi et al discloses wherein the manipulation chamber (Figure 4, "6") is installed on the output side of the lens arrangement between the lens arrangement (Figures 4 and 5, "22") and the image plane (Figure 4, "21").

In regards to claims 38 and 39, Kosugi et al discloses a projection lens for microlithography (column 1, lines 15-30 and column 4, lines 25-28, Figure 3, "22"), having an object plane (column 4, lines 25-26, Figure 4, "20"), having an image plane (column 4, lines 28-30, Figure 4, "21"), having a lens arrangement (Figures 4 and 5, "22") and having at least one gas chamber filled with gas (column 4, lines 59-61, Figure 4, "6"), wherein the gas chamber is constructed between adjacent approximately plane-parallel optical elements (column 8, lines 1-19, Figure 5, "3, 4") to form a manipulation chamber (Figure 4, "6"), the manipulation chamber being connected to pressure change means (column 4, lines 61-68, Figure 4, "29"), but does not specifically disclose said manipulation chamber being connected to a gas composition change means. Within the same field of endeavor, Taniguchi teaches that it is well known for manipulation chambers in projection exposure systems to undergo changes in pressure or gas composition to correct for image distortion (column 9, lines 11-16).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the manipulation chamber of Kosugi et al to be connected to a gas composition change means since Taniguchi teaches that it is well

Art Unit: 2873

known for manipulation chambers in projection exposure systems to undergo changes in pressure or gas composition to correct for image distortion, which also would inherently also comprise a pressure change means since different gases contribute different partial pressures to a system.

In regards to claim 41 and 42, Kosugi et al discloses a projection lens (column 4, lines 25-28, Figure 3, "22"), having an object plane (column 4, lines 25-26, Figure 4, "20"), having an image plane (column 4, lines 28-30, Figure 4, "21"), having a lens arrangement (Figures 4 and 5, "22") and having at least one gas chamber filled with gas (column 4, lines 59-61, Figure 4, "6"), wherein the gas chamber is constructed as an at least approximately plane-parallel manipulation chamber (column 8, lines 1-19, Figure 5, "3, 4") located in the lens arrangement (Figure 5, "6") and between an end plate (Figure 5, "3") and the lens situated adjacent to the end plate (Figure 5, "4"), and wherein the manipulation chamber is connected with pressure change means (column 4, lines 61-68, Figure 4, "29"), but does not specifically disclose said manipulation chamber being connected to a gas composition change means. Within the same field of endeavor, Taniguchi teaches that it is well known for manipulation chambers in projection exposure systems to undergo changes in pressure or gas composition to correct for image distortion (column 9, lines 11-16).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the manipulation chamber of Kosugi et al to be connected to a gas composition change means since Taniguchi teaches that it is well known for manipulation chambers in projection exposure systems to undergo changes

Art Unit: 2873

in pressure or gas composition to correct for image distortion, which also would inherently also comprise a pressure change means since different gases contribute different partial pressures to a system.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kosugi et al as applied to claim 1 above, and further in view of Tanaka et al (U.S. 2003/0020888 A1).

In regards to claim 28, Kosugi discloses as set forth above, but does not specifically disclose the projection exposure machine having a light source which outputs radiation of wavelength shorter than 370 nm. Within the same field of endeavor, Tanaka et al teaches that it is well known in the art of gas manipulated exposure apparatuses, for light sources to output wavelengths shorter than 370 nm (page 1, section [0007]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the projection exposure machine of Kosugi et al to have a light source which outputs radiation of wavelength shorter than 370 nm since Tanaka et al teaches that it is well known in the art of gas manipulated exposure apparatuses, for light sources to output wavelengths shorter than 370 nm.

Allowable Subject Matter

Claims 20, 23 and 36 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach a combination of all the claimed features as presented

Art Unit: 2873

in claims 20, 23 and 36: a system for a projection lens as claimed, specifically including an at least approximately plane-parallel manipulable gas interspace as claimed, in the sixth optical group.

Claims 25, 27, 30, 34 and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach a combination of all the claimed features as presented in claim 25: a system for a projection lens as claimed, specifically including an at least approximately plane-parallel manipulable gas interspace as claimed, in the sixth optical group.

The prior art fails to teach a combination of all the claimed features as presented in claims 27 and 35: a system for a projection lens as claimed, specifically including an at least approximately plane-parallel manipulable gas interspace as claimed, in the sixth optical group.

The prior art fails to teach a combination of all the claimed features as presented in claim 30: a method as claimed, specifically wherein the manipulation chamber is installed in the projection lens on the input side of the lens arrangement or on the side of the mask.

The prior art fails to teach a combination of all the claimed features as presented in claim 34: a method as claimed, specifically wherein when the projection lens is being

Art Unit: 2873

tuned a filling gas is introduced which is subsequently exchanged by the operator for a gas mixture.

Examiner's Comment

Applicant is encouraged to submit a clean copy of the current pending claims since the current set within the application, although readable, might present problems during scanning.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Choi whose telephone number is (703) 305-3100. The examiner can normally be reached on Monday-Friday from about 9:00 am to 6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y. Epps can be reached on (703) 308-4883. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Application/Control Number: 09/847,658

Page 14

Art Unit: 2873


b.c

William Choi

Patent Examiner

Art Unit 2873

September 29, 2003


Georgia Epps
Supervisory Patent Examiner
Technology Center 2800